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Dear Ms. Carina Popovici,

I am a student in the Digital Humanities Master at the Swiss Federal Institute of Technology in Lausanne (EPFL). I am currently writing my Master's thesis on topological data analysis of learned visual embeddings. The thesis brings together methods from geometry, computer science, artificial intelligence and art history to find influences between paintings, looking at the 340'000 artwork photographs owned by the Cini Foundation. The thesis, I believe, summarizes my interests and expertise quite well. I am an art enthusiast who grew up in Rome, in the fascination of the Ancient, the Baroque, and the Decadent wonders of the city. Over the years, I built a strong background in the humanities and excellent knowledge of data science and deep learning.

With this letter, I would like to show my interest in working in Data Science and/or Machine Learning/Deep Learning at Art Recognition.

During my bachelor's in Information Sciences at Amsterdam University College, I had the pleasure to intern for a year at a data science start-up founded by one of my professors, Breanndán Ó Nualláin. I found an incredibly collaborative, self-directed, and enriching atmosphere in the company, which quickly boosted my machine learning and deep learning competencies. Among others, I set up the first company's database in PostgreSQL. I accompanied it with a set of functions that produced custom aggregated information of our historical data at a speed that was two orders of magnitude faster than its previous implementation in Python. This project was expanded after the end of my internship and is now in production.

I wrote my bachelor thesis with the supervision of Prof. Giovanni Colavizza on 'Multi-label classification of artworks into their represented icon(s).' The essay drew together the field of computer vision and deep learning with more theoretical analyses of iconography in art. In particular, I trained several multi-label SOTA models on the Tate collection to assess which classification head and pretrained features were most generalizable to the task of finding the iconographical content of artworks (in particular, modern and contemporary ones). The results went beyond my expectations; somehow, even when nothing of the icon was visible in the painting, some models uncovered it.

With the same interest that drove my undergraduate studies and intending to continue applying technology to art, I decided to pursue an MSc in Digital Humanities at the Swiss Federal Institute of Technology Lausanne (EPFL), which I will shortly graduate with top of the class grades. Among other projects, I worked towards finding new methods to analyze and assess the level of tonal ambiguity (a concept roughly at the turning point between musical

tonality and atonality) in piano compositions by Debussy. I adopted computational methods based on wavescapes (a hierarchical visualization tool of resonant scales based on Discrete Fourier Transform) to make such a complex concept, which is only accessible to very few, analyzable automatically by anyone. I am in the process of publishing a paper on this project.

While doing my master's internship at Peter Lang, an Academic Publishing Group, I found ground for great innovation. The company seeked to reinvent search engines for Social Sciences and Humanities (SSH) books. With this aim, I set up a database (NoSQL) and search engine (elasticsearch), I enriched the metadata using methods that ranged from BERT classification to keyword matching and added a total of 40 new features. Furthermore, I designed the web platform from zero using plain CSS (and Bootstrap), PHP to call the database, HTML and Javascript, used for the interactive visualizations accompanying the search results and different pages (using Leaflet and D3), word clouds, charts (Google Charts), and other features. The prototype was such a success that, from a small side project for the company, an entire team of Editors has joined the project for brainstorming and testing sessions. The final prototype can be found here.

I firmly believe that my background perfectly fits this company. I have a profound knowledge of data science and Python, in which I have worked for over 1.5 years. I have experience with handling data related to the arts and in deep learning, reinforcement learning, natural language processing and computer vision.

I intend to continue pursuing better ways to combine technology and the humanities, and I believe this experience can represent the perfect application of my learning trajectory.

Best regards,

Ludovica Schaerf